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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/589,511	08/15/2006	Shigenori Ozaki	295037US26PCT	8324

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EXAMINER	
DEO, DUY VU NGUYEN	
ART UNIT	**PAPER NUMBER**
1792	

NOTIFICATION DATE	DELIVERY MODE
11/24/2009	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/589,511	OZAKI ET AL.	
	Examiner	Art Unit	
	Duy-Vu N. Deo	1792	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *09 October 2009*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6,9-17,20,21,23-25,29,35,38-42,47,48 and 52-56* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6,9-17,20,21,23-25,29,35,38-42,47,48 and 52-56* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *15 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *8/15/06*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 3, 4, 13, 14, 24, 47, 48 are rejected under 35 U.S.C. 102(a) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Itano (US 2003/0127118).

Itano teaches a method for cleaning byproducts including W from a chamber using a plasma containing O2, H2, and an inert gas of Ar (paragraphs 0008, 0010, 0013, claims 5) and the chamber pressure is 100 mtorr (less than 126 Pa). Even though he is silent about supplying the processing gas mixture without setting the chamber opened to the atmosphere. However, as described in paragraph 0013, the processing parameters are set at a certain pressure and gas flow rates, and HF power to create plasma. The chamber must be closed in order to create such condition and to

create plasma. In alternative, one skilled in the art would find it obvious to close the chamber from the atmosphere when supplying the processing in order to have a controlled cleaning environment.

4. Claims 29, 52, 53, 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itano.

Referring to claim 29, it would be obvious that the cleaning step is to prepare for another plasma process in the process chamber.

Referring to claim 56, performing another same cleaning step would have been obvious to one skilled in the art in order to provide a clean chamber for the next process.

5. Claims 2, 11, 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itano as applied to claims 1, 14 above, and further in view of admitted prior art.

Referring to claims 2, 15 Itano doesn't describe the process on the substrate is an oxidation process. However, oxidation process is a well known step during the process of a semiconductor substrate as describes in paragraphs 0002-0003. Therefore, depending on the desired product, it would be obvious to one skilled in the art that the cleaning method described by Itano can be part of any semiconductor manufacturing process and applied after the step such as claimed oxidation step and would still be able to clean the chamber with predictable results.

Referring to claim 11, even though Itano is silent about heating the chamber by the plasma prior to cleaning, it would be obvious that the plasma would create heat and raise the chamber temperature before cleaning.

6. Claims 9, 10, 20, 21, 23, 54, 55 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itano as applied to claims 1, 13, 53 above, and further in view of Jain et al. (US 6,613,682).

Referring to the limitations of having claimed chamber temperature and ratios of the cleaning gas H2 to O2, even though Itano doesn't describe claimed ratios and chamber temperature ranges. However, the temperature and the gas concentrations or ratios are result-effective variables and they are determined through routine experimentation as shown here by Jain (col. 6, lines 44-50; table II). One skilled in the art would find it obvious at the time of the invention was made to determine the optimum ratios between the H2 and O2 and the chamber temperature so that the chamber is cleaned with predictable results.

7. Claims 5, 6, 12, 16, 17, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itano as applied to claims 1, 4, 13 above, and further in view of Sato et al. (US 5,861,601).

Referring to the limitations of generating the plasma by applying microwaves through a planar antenna having a plurality of slots, even though Itano doesn't describe such apparatus; However, this type of plasma generating apparatus has been known and used by one skilled in the art as shown here by Sato. He teaches a microwave plasma processing apparatus having quartz (dielectric material) sidewall and a planar antenna having a plurality of slots (col. 4, lines 15-36; col. 9, lines 5-10). It would have been obvious to one skilled in the art to clean any apparatus including claimed

microwave generating apparatus as long as it would able to create plasma to clean the chamber with predictable results.

Referring to claims 12, 25 the cleaning process would expose the quartz (dielectric material) sidewall of the chamber to the cleaning plasma.

8. Claims 35, 38-42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Itano and further in view of Suzuki et al. (US 2002/0155714).

Referring to the limitation of detecting the processing endpoint by measuring the emission intensity of radicals that increase with the cleaning process, such method of detecting processing end-point by measuring the emission intensity of radicals that increase with a process is well known to one skilled in the art. Suzuki teaches such method for an etching process (paragraph 0148). It would have been obvious for one skilled in the art at the time of the invention was made to apply such end-point detecting method to a cleaning process taught by Itano because using known processes without changes in their respective functions, in this instant measuring emission intensity of radicals to detect the cleaning endpoint, would yield predictable results.

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

10. Claims 47 and 48 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claims 47 and 48 appear to have the same limitations.

11. Claims 47-56 are objected to because of the following informalities: claim 46 is indicated as cancelled; however, there is no original claim 46. Claim 47-56 should be renumbered starting with number 46. Appropriate correction is required.

Election/Restrictions

12. Applicant's election without traverse of the method claims in the reply filed on 10/9/09 is acknowledged.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Duy-Vu N. Deo whose telephone number is 571-272-1462. The examiner can normally be reached on Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Duy-Vu N Deo/

Primary Examiner, Art Unit 1792

11/18/09